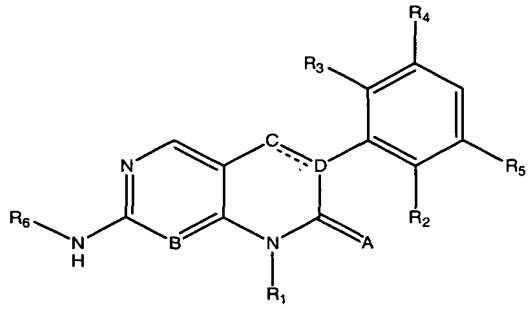
CLAIMS

What is claimed is:

1. A compound of the formula:



wherein:

A is O, NH_2, $NH(C_1\text{-}C_6$ alkyl), $N(C_1\text{-}C_6$ alkyl)$_2$, or -NHC(O)-NHR_{12};

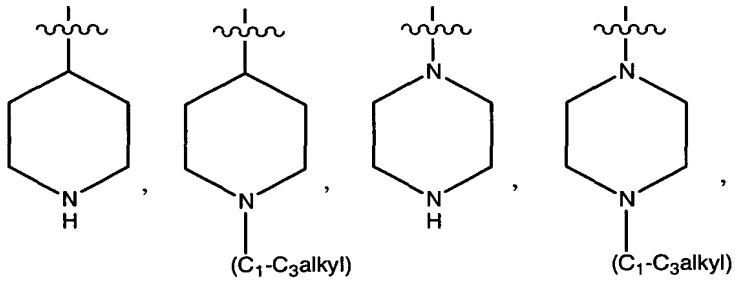
R_{12} is $C_1\text{-}C_6$ straight or branched chain alkyl, or $-(CH_2)_n\text{-}C_3\text{-}C_8$ cycloalkyl ring; n is an integer of from 1 to 3;

B, C and D are independently selected from CH or N, with the proviso that C and D are not both N;

R_1 is selected from the group of $C_1\text{-}C_6$ straight or branched chain alkyl, optionally substituted by -COOH, or;

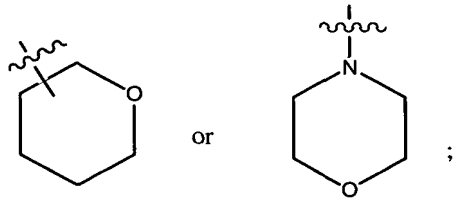
a) a phenyl, benzyl or $C_3\text{-}C_8$ cycloalkyl ring, or $-CH_2\text{-}C_3\text{-}C_8$ cycloalkyl ring, with the phenyl, benzyl or cycloalkyl rings being optionally substituted by 1 or 2 COOH or $-CH_2$-COOH groups; or

b) a piperidine or piperazine moiety selected from group of:



the rings of the piperidine or piperazine moieties being optionally substituted by 1 or 2 COOH or -CH_2-COOH groups; or

c) a tetrahydropyran or morpholine moiety of the formulae:



;

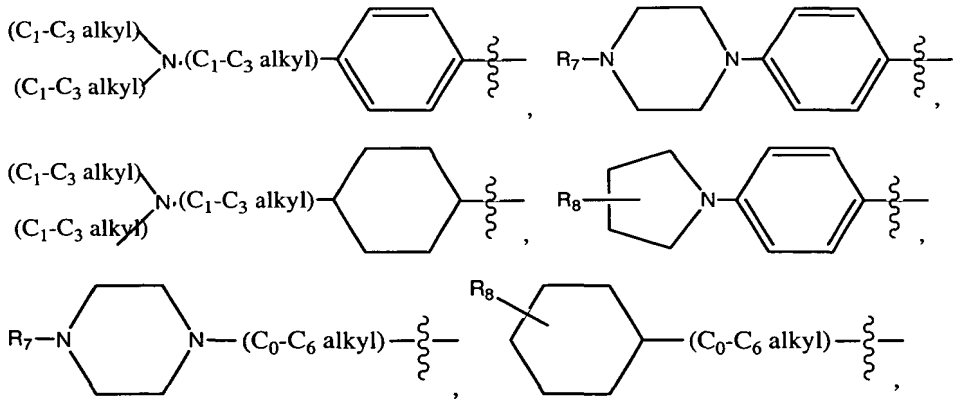
R_2 is H, Cl or F;

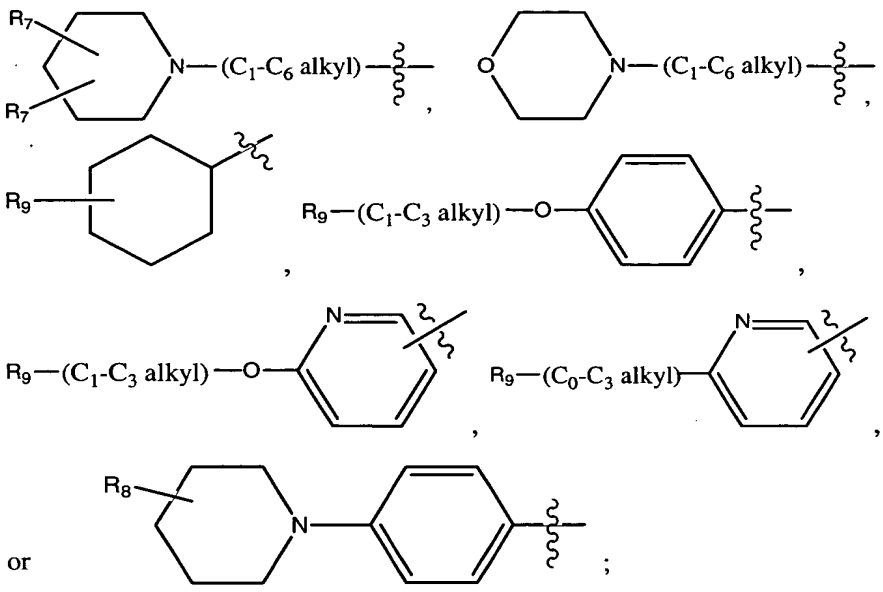
R_3 is H, Cl or F, with the proviso that at least one of R_2 or R_3 is F;

R_4 is H, OH, -OCH_3, or -OCH_2CH_3, with the proviso that, if R_4 is H, R_2 and R_3 are not H;

R_5 is -OCH_3, or -OCH_2CH_3;

R_6 is selected from the group of H, -(C_1-C_5 alkyl)-NH_2, -(C_1-C_5 alkyl)-NH-(C_1-C_3 alkyl)-R_{11}, -(C_1-C_5 alkyl)-N-(C_1-C_3 alkyl-R_{11})$_2$, -O-(C_1-C_5 alkyl)-NH_2, -O-(C_1-C_5 alkyl)-NH-(C_1-C_3 alkyl)-R_{11}, -O-(C_1-C_5 alkyl)-N-(C_1-C_3 alkyl-R_{11})$_2$, -$CH(CH_2OH)_2$, -(C_1-C_3 alkyl)-$(CH_2OH)_2$, -(C_1-C_3 alkyl)-O-(C_1-C_3 alkyl)-R_{11}, -(C_1-C_3 alkyl)-O-(C_1-C_3 alkyl)-NH_2, -(C_1-C_3 alkyl)-O-(C_1-C_3 alkyl)-NH-(C_1-C_3 alkyl)-R_{11}, -(C_1-C_3 alkyl)-O-(C_1-C_3 alkyl)-N(C_1-C_3 alkyl-R_{11})$_2$, phenyl substituted by one or two groups selected from NH_2, -N(C_1-C_3 alkyl), -N(C_1-C_3 alkyl)$_2$, CN or -(C_1-C_3 alkyl)-tetrazole, or C_1-C_6 alkyl,





with each of the alkyl chains of any group in this R_4 definition being optionally substituted by from 1 to 4 OH groups;

R_7 in each instance is independently selected from H, $-NH_2$, $NH(C_1\text{-}C_3$ alkyl), $N(C_1\text{-}C_3$ alkyl)$_2$, or $C_1\text{-}C_3$ alkyl;

R_8 is H, OH or $C_1\text{-}C_3$ alkyl;

9 H, OH, $-NH_2$, $NH(C_1\text{-}C_3$ alkyl), or $N(C_1\text{-}C_3$ alkyl)$_2$;

R_{10} is H or $C_1\text{-}C_3$ alkyl;

R_{11} is H, CN, OH, NH_2, F, or CF_3;

or a pharmaceutically acceptable salt or ester form thereof.

2. A compound of Claim 1 selected from the group of:

1-Cyclopentyl-7-(4-diethylamino-butylamino)-3-(2,6-difluoro-3-hydroxy-5-methoxy phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-7-(4-diethylamino-butylamino)-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

(S,S)-1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-[(5-hydroxymethyl-2-phenyl-[1,3]dioxolan-4-ylmethyl)-amino]-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

(S,S)-1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(2,3,4-trihydroxy-butylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(4-hydroxy-cyclohexylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(2-hydroxy-1-hydroxymethyl-ethylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

7-(3-Amino-2-hydroxy-propylamino)-1-cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-[2-(2-hydroxy-ethoxy)-ethylamino]-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopropyl-7-(4-diethylamino-butylamino)-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or

7-(4-Diethylamino-butylamino)-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-1-ethyl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

or a pharmaceutically acceptable salt or ester form thereof.

3. A compound of Claim 1 selected from the group of:

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-1-ethyl-7-(2-hydroxy-1-hydroxymethyl-ethylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-1-ethyl-7-(4-hydroxy-cyclohexylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(2,3-dihydroxy-butylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(2,3-dihydroxy-propylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or

7-(4-Amino-2,3-dihydroxy-butylamino)-1-cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-([S,S]-2,3,4-trihydroxy-butylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-1-ethyl-7-[2-(2-hydroxy-ethoxy)-ethylamino]-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

7-(4-Amino-2,3-dihydroxy-butylamino)-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-1-ethyl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

7-{3-[Bis-(2-hydroxy-ethyl)-amino]-propylamino}-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-1-ethyl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or

1-Cyclopentyl-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-(2,3-dihydroxy-propylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or a pharmaceutically acceptable salt or ester form thereof.

4. A compound of Claim 1 selected from the group of:

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-7-(2,3-dihydroxy-butylamino)-1-ethyl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

Ethyl-4-[3-(2,6-difluoro-3,5-dimethoxy-phenyl)-7-methylamino-2-oxo-3,4-dihydro-2H-pyrimido[4,5-d]pyrimidin-1-yl]-cyclohexanecarboxylate;

4-[3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-7-methylamino-2-oxo-3,4-dihydro-2H-pyrimido[4,5-d]pyrimidin-1-yl]-cyclohexanecarboxylic acid;

7-Amino-3-(2,6-difluoro-3,5-dimethoxy-phenyl)-1-piperidin-4-yl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; compound with trifluoroacetic acid; or

1-Cyclopentyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-(2-hydroxy-1-hydroxymethyl-ethylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Ethyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-(4-hydroxy-butylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

(S)-1-Cyclopentyl-7-(2,3-dihydroxy-propylamino)-3-(2-fluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Ethyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-(4-hydroxy-cyclohexylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

4-[3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-7-methylamino-2-oxo-3,4-dihydro-2H-pyrimido[4,5-d]pyrimidin-1-yl]-piperidine-1-carboxylic acid; or

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-7-methylamino-1-piperidin-4-yl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

3-(2,6-Difluoro-3,5-dimethoxy-phenyl)-7-(2,3-dihydroxy-propylamino)-1-ethyl-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

1-Cyclopentyl-7-(4-diethylamino-butylamino)-3-(3-ethoxy-2,6-difluoro-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

(R)-1-Cyclopentyl-7-(2,3-dihydroxy-propylamino)-3-(2-fluoro-3,5-dimethoxy-phenyl)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

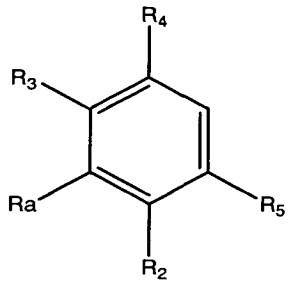
1-Ethyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-[2-(2-hydroxy-ethoxy)-ethylamino]-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one; or

1-Cyclopentyl-3-(2-fluoro-3,5-dimethoxy-phenyl)-7-(*trans*-4-hydroxy-cyclohexylamino)-3,4-dihydro-1H-pyrimido[4,5-d]pyrimidin-2-one;

or a pharmaceutically acceptable salt or ester form thereof.

5. A pharmaceutical composition comprising a pharmaceutically effective amount of a compound of Claim 1 and a pharmaceutically acceptable carrier.

6. A compound of the formula:



wherein:

R_2 is Cl or F;

R_3 is Cl or F, with the proviso that at least one of R_2 or R_3 is F;

R_4 is H, OH, $-OCH_3$, or $-OCH_2CH_3$;

R_5 is $-OCH_3$, or $-OCH_2CH_3$;

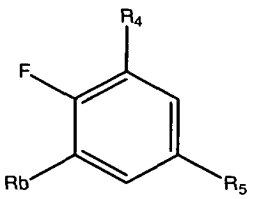
Ra is selected from the group of NH_2, I, CN, $-CH_2CN$, -C(O)CN, $-CH_2OH$, -C(O)H, -C(O)OR, $-CH_2C(O)OR$, -C(O)C(O)OR; and

R is selected from H or C_1-C_6 alkyl.

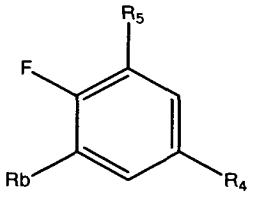
7. A compound of Claim 9 wherein of R_2 and R_3 are fluorine, and R_4, R_5, Ra, and R are as defined in Claim 10.

8. A compound of Claim 9 wherein of R_2 and R_3 are fluorine, R_4 is $-OCH_3$, R_5 is $-OCH_3$ or $-OCH_2CH_3$, Ra is NH_2, I, CN, $-CH_2CN$, -C(O)CN, $-CH_2OH$, -C(O)H, -C(O)OR, $-CH_2C(O)OR$, or -C(O)C(O)OR; and R is H or C_1-C_6 alkyl.

9. A compounds of the formulae:



or



wherein:

R_4 is H, OH, $-OCH_3$, or $-OCH_2CH_3$;

R_5 is $-OCH_3$, or $-OCH_2CH_3$;

Rb is selected from the group of NH_2, I, CN, $-CH_2CN$, -C(O)CN, $-CH_2OH$, -C(O)H, -C(O)OR, $-CH_2C(O)OR$, and -C(O)C(O)OR; with the proviso that when Rb is -C(O)H, R_4 and R_5 are not both $-OCH_3$; and

R is selected from H or C_1-C_6 alkyl.